

p:tac

AAATGAGCTG TTGACAATTA ATCATCGGCT CGTATAATGT GTGGAATTGT GAGCGGATAA
EcoRI SacI KpnISmaI
CAATTCACA CAGGAAACAG AATTCGAGCT CGGTACCCGG GCTACATGGA GATTAACATCA
RBS | -> α -globin
ATCTAGAGGG TATTAATAAT GTATCGCTTA AATAAGGAGG AATAACATAT GGTGCTGTCT
CCTGCCGACA AGACCAACGT CAAGGCCGCC TGGGGTAAGG TCGGCGCGCA CGCTGGCGAG
TATGGTGCAGG AGGCCCTGGA GAGGATGTT CTTGCTCTCC CCACCCACAA GACCTACTTC
CCGCACCTCG ATCTGAGCCA CGGCTCTGCC CAGGTTAAGG GCCACGGCAA GAACGTGGCC
GACGCGCTGA CCAACGCCGT GGCGCACGTG GACGACATGC CCAACGCCGT GTCCGCCCTG
AGCGACCTGC ACGGCACAA GCTTCGGGTG GACCCGGTCA ACTTCAAGCT CCTAAGCCAC
TGCCTGCTGG TGACCCCTGGC CGCCCACCTC CCCGCCAGT TCACCCCTGC GGTGCACGCC
-> |
TCCCTGGACA AGTCCTGGC TTCTGTGAGC ACCGTGCTGA CCTCCAAATA CCGTTAAACT
RBS | -> β -globin
AGAGGGTATT AATAATGTAT CGCTTAAATA AGGAGGAATA ACATATGGTG CACCTGACTC
CTGAGGAGAA GTCTGCCGTT ACTGCCCTGT GGGGCAAGGT GAACGTGGAT GAAGTTGGTG
GTGAGGCCCT GGGCAGGCTG CTGGTGGTCT ACCCTTGGAC CCAGAGGTTC TTTGAGTCCT
TTGGGGATCT GTCCACTCCT GATGCTGTTA TGGGCAACCC TAAGGTGAAG GCTCATGGCA
AGAAAGTGCT CGGTGCCTTT AGTGATGGCC TGGCTCACCT GGACAAACCTC AAGGGCACCT
TTGCCACACT GAGTGAGCTG CACTGTGACA AGCTGCACGT GGATCCGTGAG AACTTCAGGC
 β 108Asn->Gln
TCCTGGGACA AGTACTGGTC TGTGTGCTGG CCCATCACTT TGGCAAAGAA TTCACCCAC
CAGTGCAGGC TGCTATCAG AAAGTGGTGG CTGGTGTGGC TAATGCCCTG GCCCACAAGT
-> | SphI rrB (5S, T1, T2)
ATCACTAAGC ATGCATCTGT TTTGGCGGAT GAGAGAAGAT TTTCAGCCTG ATACAGATTA
NsiI

p:tac

AAATGAGCTG TTGACAATT A ATCATCGGCT CGTATAATGT GTGGAATTGT GAGCGGATAA
EcoRI SacI KpnISmaI
CAATTTACA CAGGAAACAG AATTCGAGCT CGGTACCCGG GCTACATGGA GATTAACCTCA
RBS | -> α -globin
ATCTAGAGGG TATTAATAAT GTATCGCTTA AATAAGGAGG AATAACATAT GGTGCTGTCT
CCTGCCGACA AGACCAACGT CAAGGCCGCC TGGGGTAAGG TCGGGCCGCC CGCTGGCGAG
TATGGTGCAGG AGGCCCTGGA GAGGATGTT C CTGTCCTTCC CCACCACCAA GACCTACTTC
CCGCACCTCG ATCTGAGCCA CGGCTCTGCC CAGGTTAAGG GCCACGGCAA GAAGGTGGCC
GACGCGCTGA CCAACGCCGT GGCGCACGTG GACGACATGC CCAACCGCCT GTCCGCCCTG
AGCGACCTGC ACGCGCACAA GCTTCGGGTG GACCCGGTCA ACTTCAAGCT CCTAAGCCAC
TGCCTGCTGG TGACCCCTGGC CGCCCACCTC CCCGCCGAGT TCACCCCTGC GGTGCACGCC
TCCCTGGACA AGTTCCCTGGC TTCTGTGAGC ACCGTGCTGA CCTCCAAATA CCGTTAAACT
RBS | -> β -globin
AGAGGGTATT AATAATGTAT CGCTTAAATA AGGAGGAATA ACATATGGTG CACCTGACTC
CTGAGGAGAA GTCTGCCGTT ACTGCCCTGT GGGGCAAGGT GAACGTGGAT GAAGTTGGTG
GTGAGGCCCT GGGCAGGCTG CTGGTGGTCT ACCCTTGGAC CCAGAGGTTC TTTGAGTCCT
TTGGGGATCT GTCCACTCCT GATGCTGTTA TGGGCAACCC TAAGGTGAAG GCTCATGGCA
AGAAAGTGCT CGGTGCCTTT AGTGATGGCC TGGCTCACCT GGACAACCTC AAGGGCACCT
TTGCCACACT GAGTGAGCTG CACTGTGACA AGCTGCACGT GGATCCTGAG AACTTCAGGT
 β 105Leu->Trp
GGCTAGGCAA CGTGCTGGTC TGTGTGCTGG CCCATCACTT TGGCAAAGAA TTCACCCAC
CAGTGCAGGC TGCCTATCAG AAAGTGGTGG CTGGTGTGGC TAATGCCCTG GCCCACAAGT
->| SphI rrB(5S, T1, T2)
ATCACTAAGC ATGCATCTGT TTTGGCGGAT GAGAGAAGAT TTTCAGCCTG ATACAGATTA
NsiI

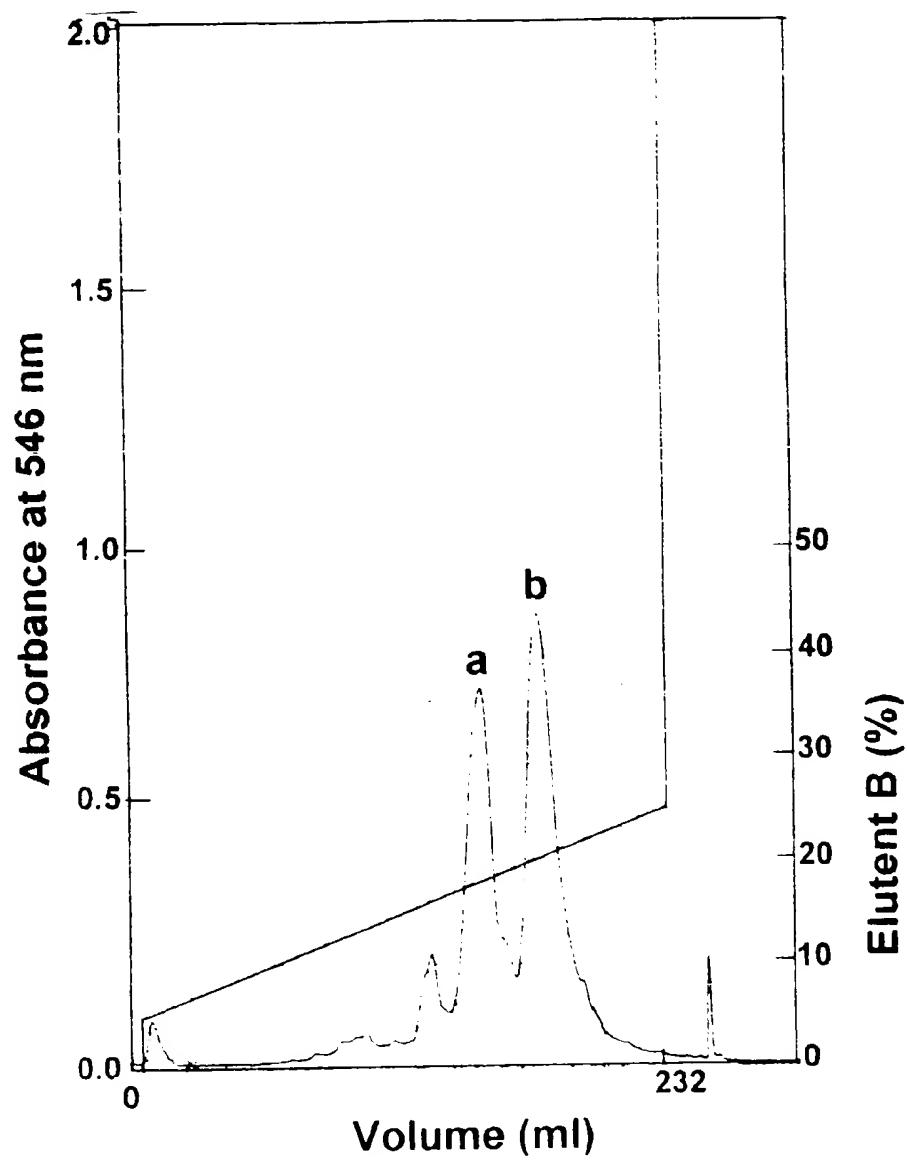


FIG. 2A

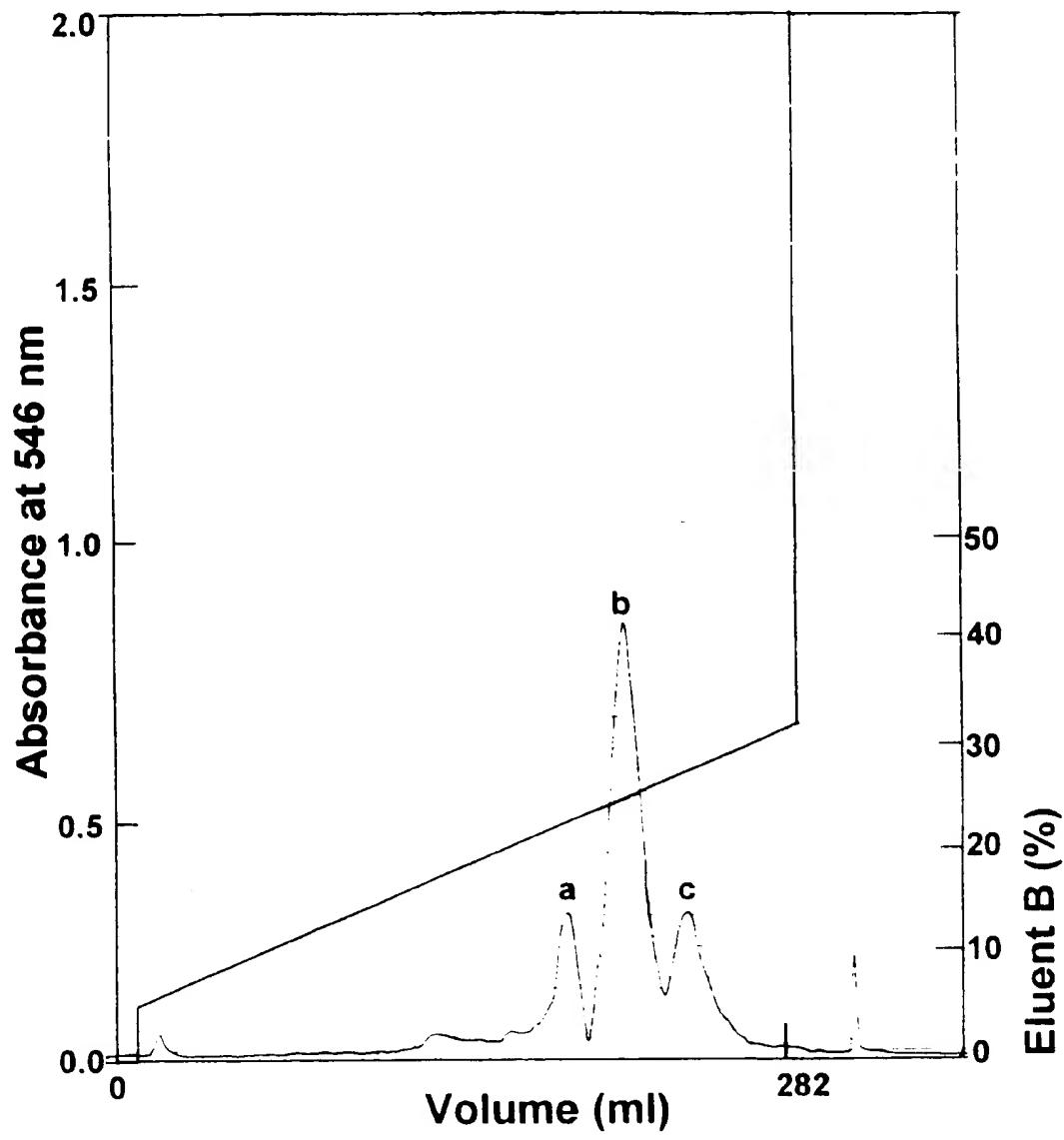


FIG. 2B

FIG. 3A

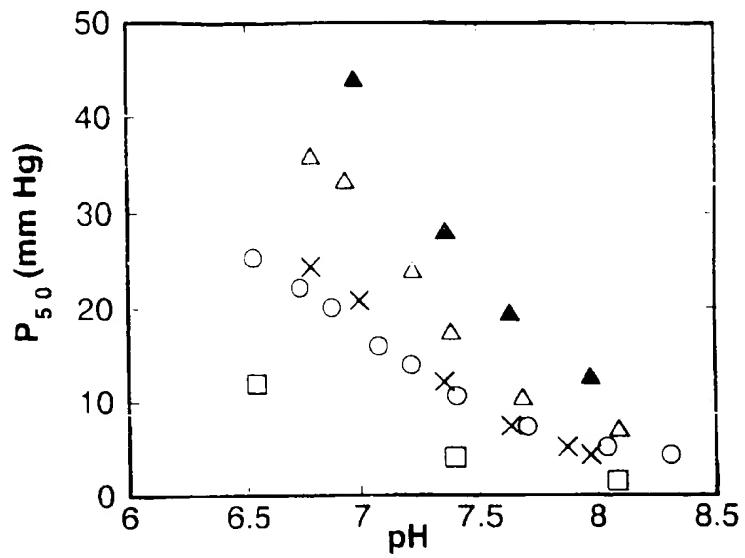
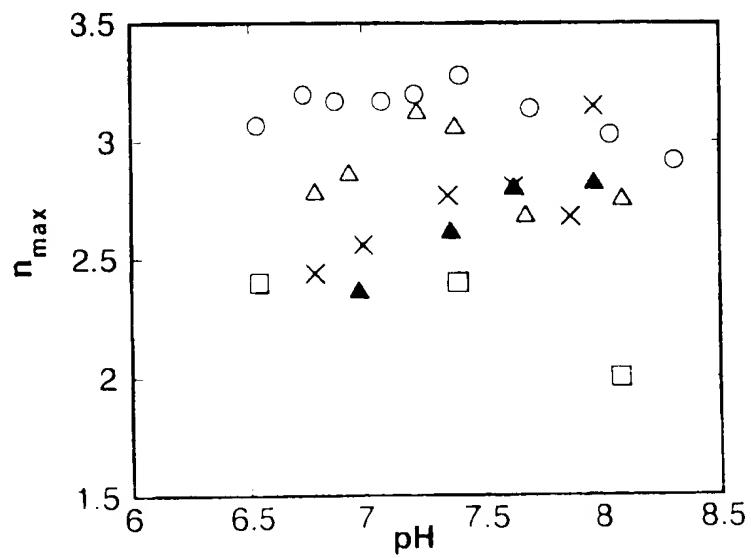


FIG. 3B



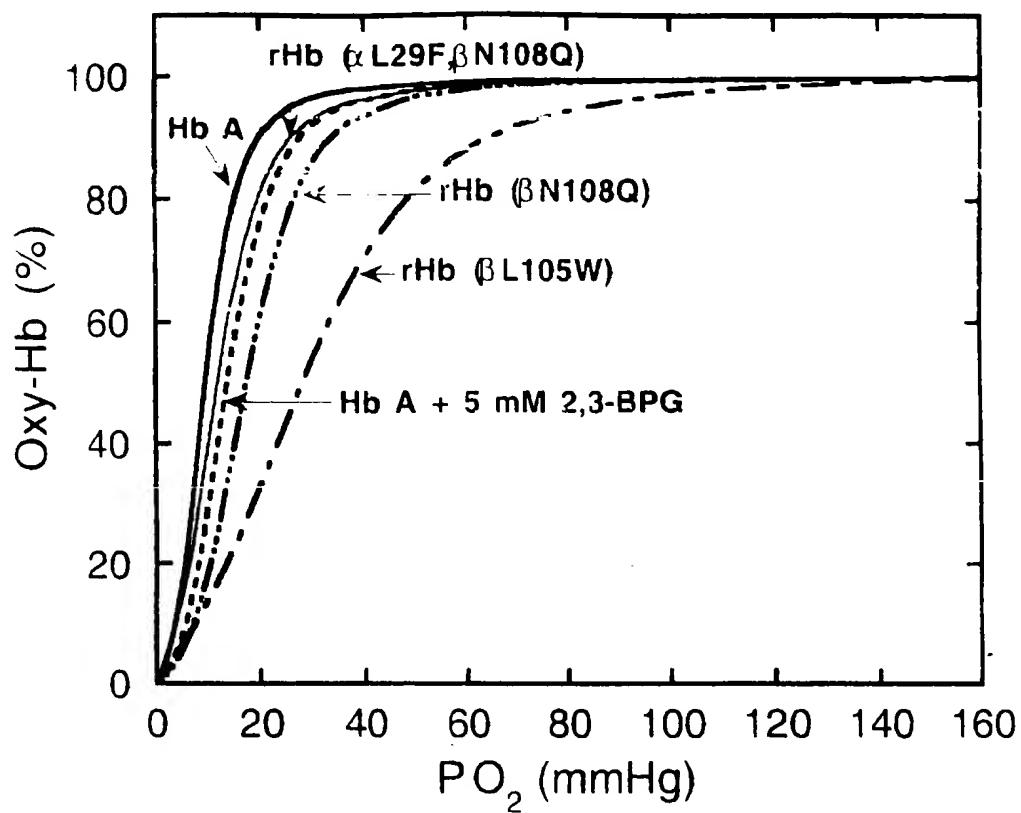


FIG. 4

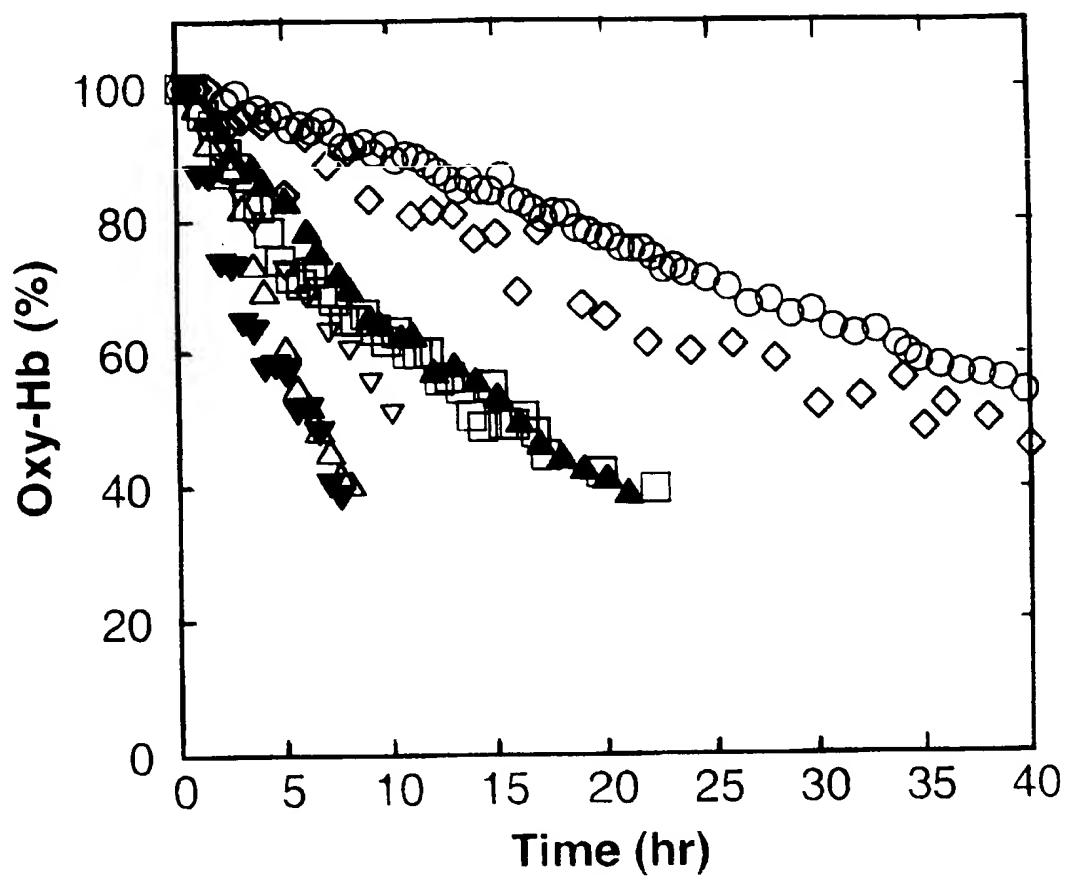


FIG. 5

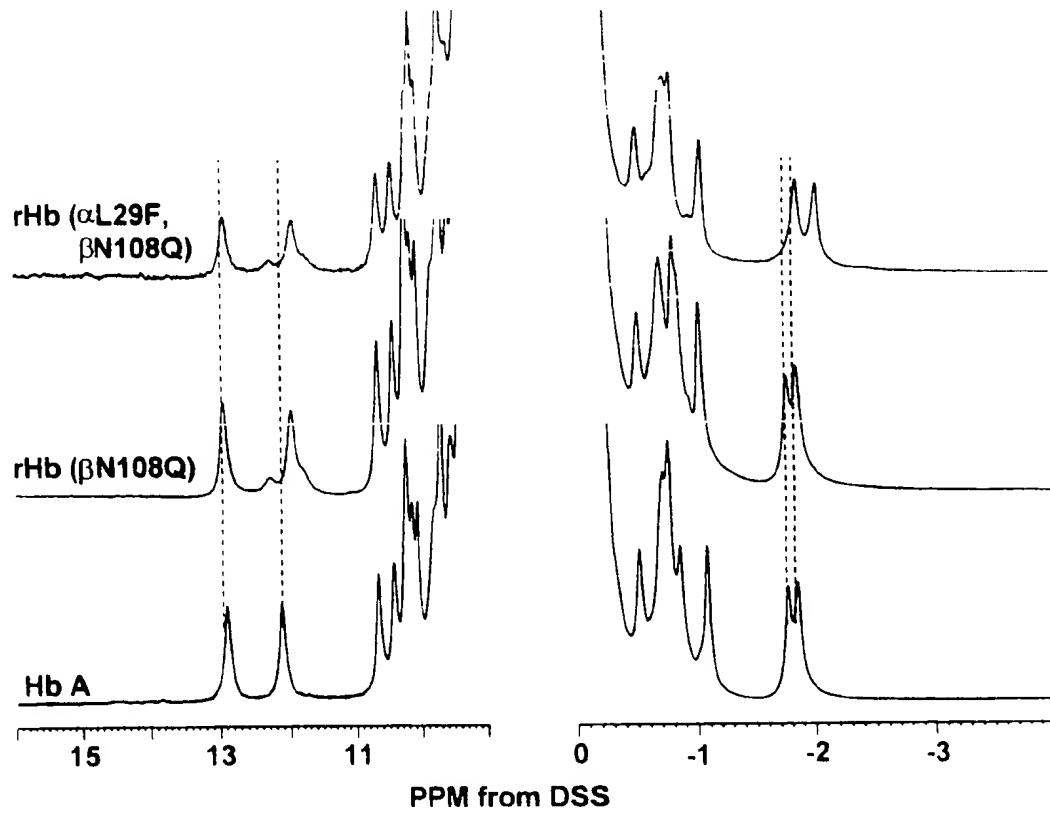
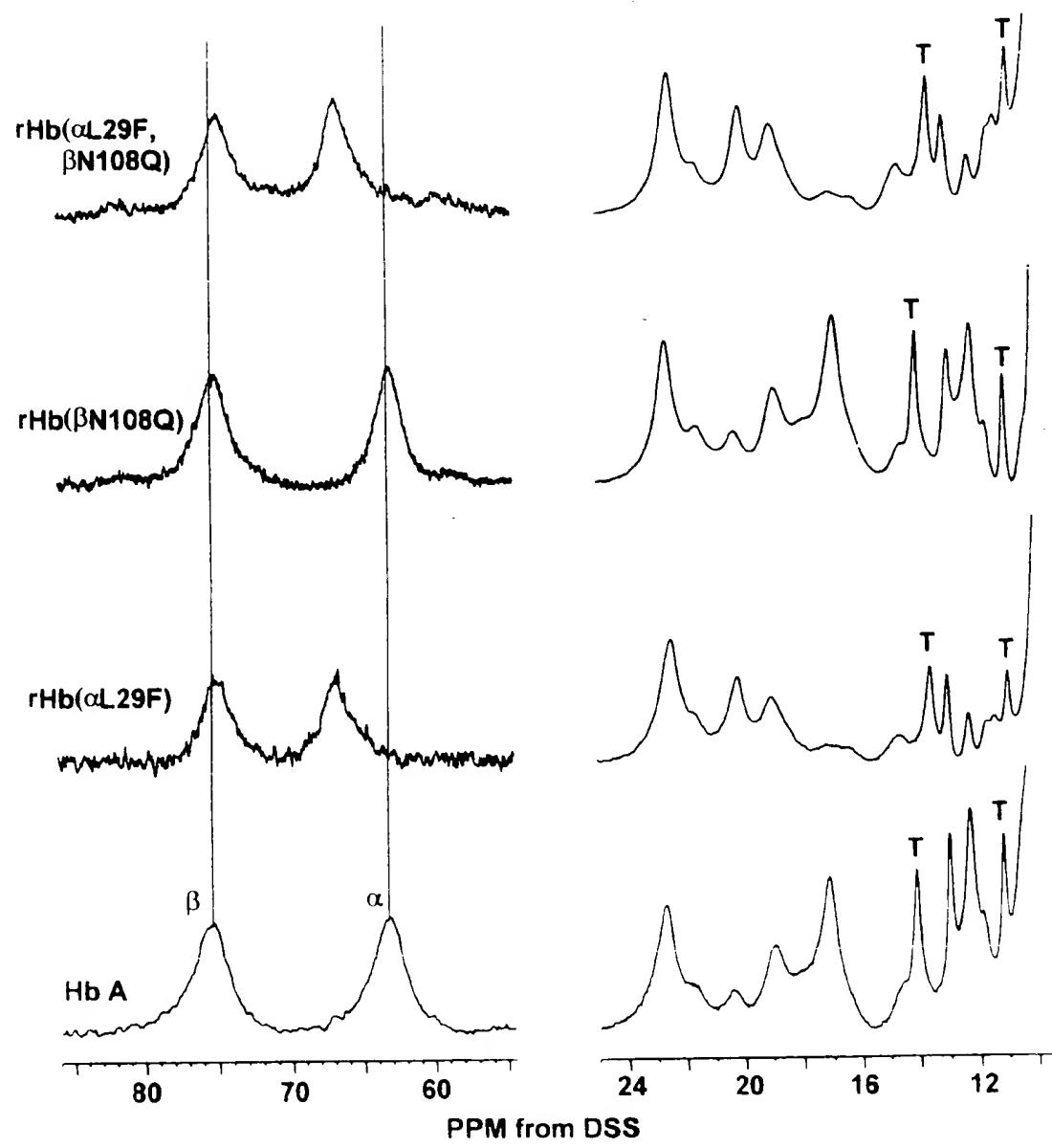
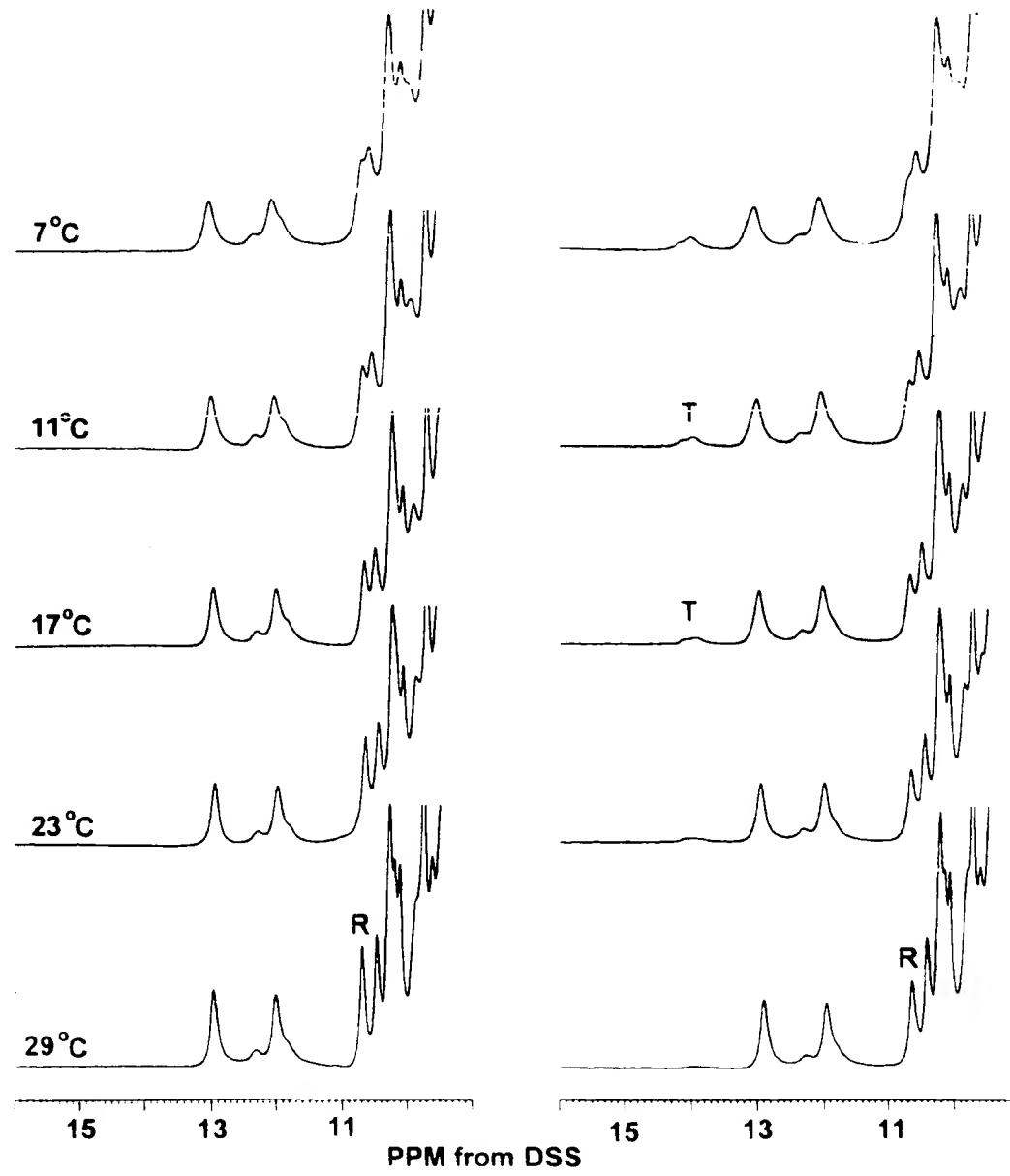
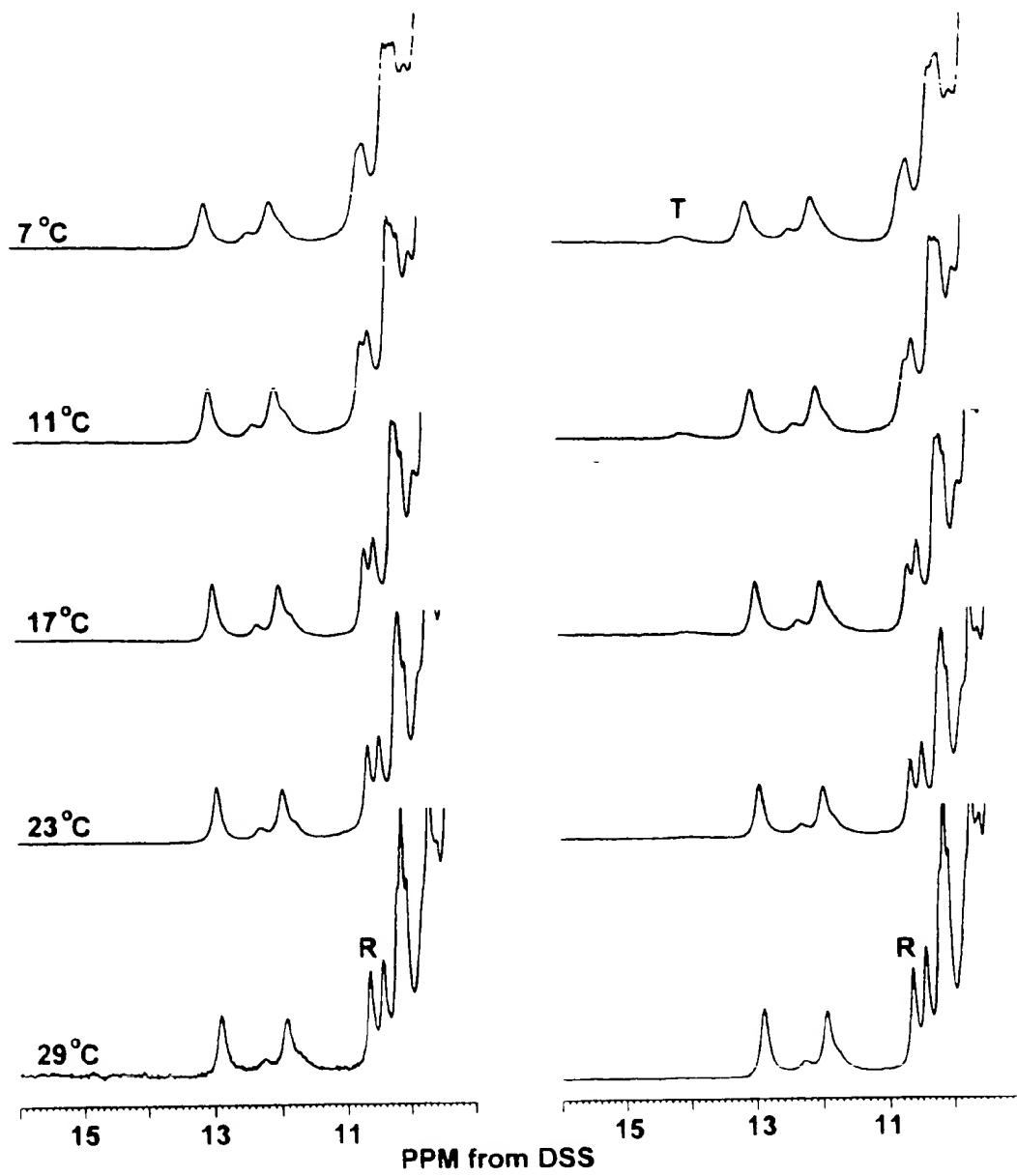


FIG. 6A

FIG. 6B







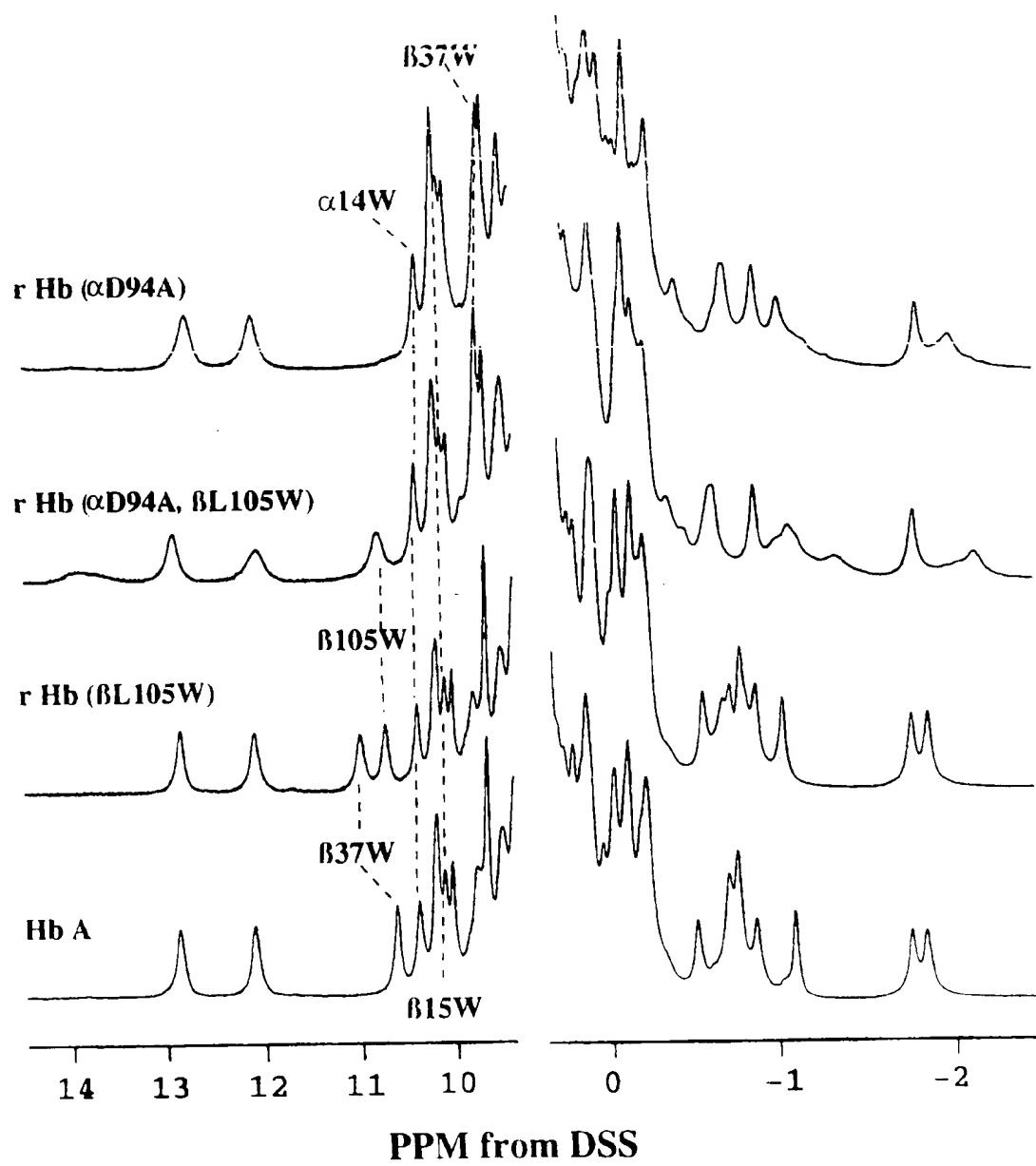


FIG. 10A

FIG. 10B

FIG. 11A

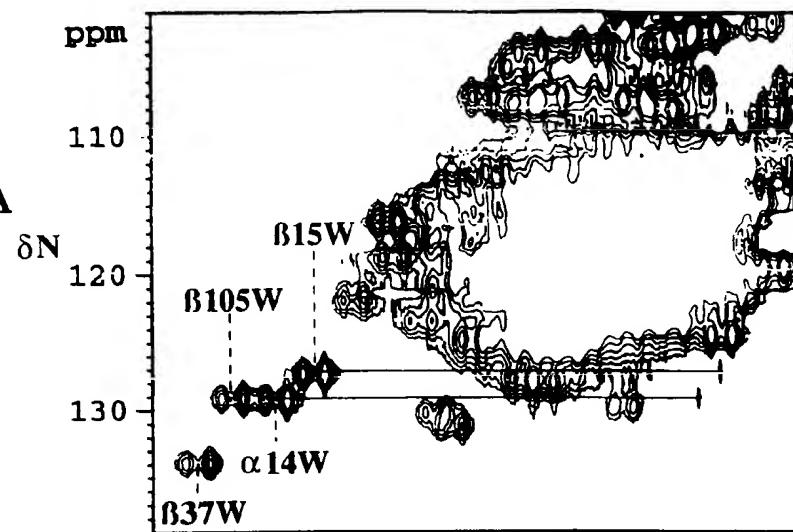


FIG. 11B

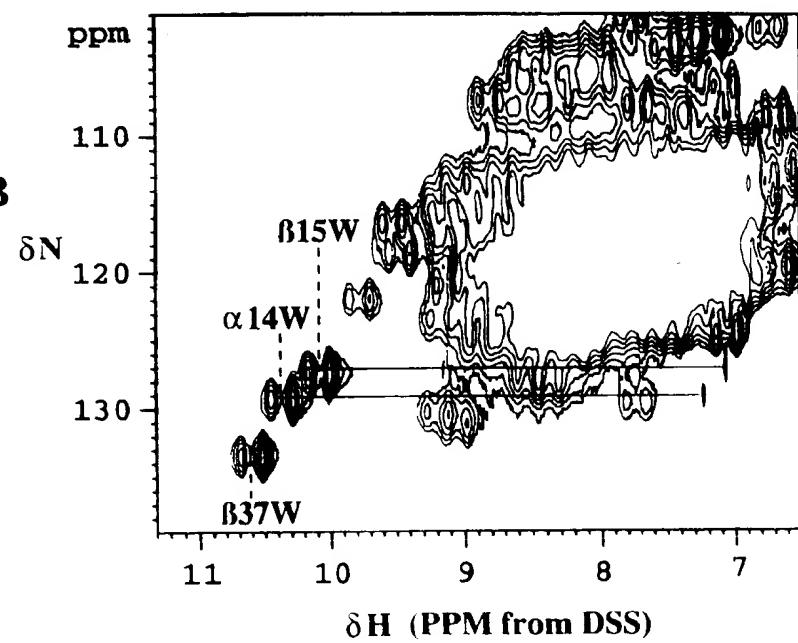


FIG. 12A

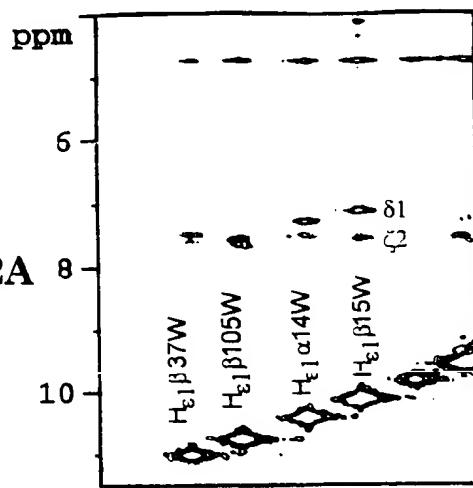


FIG. 12B

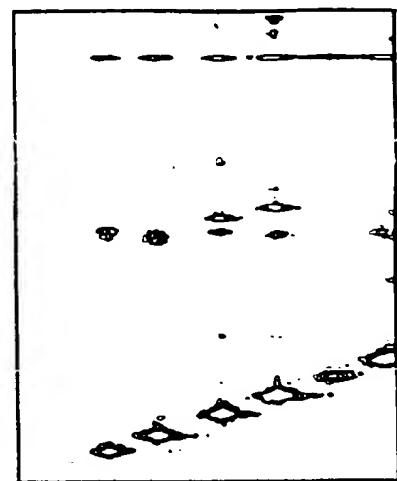


FIG. 12C

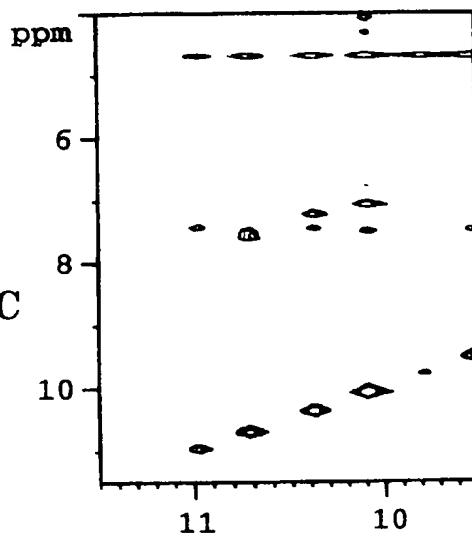
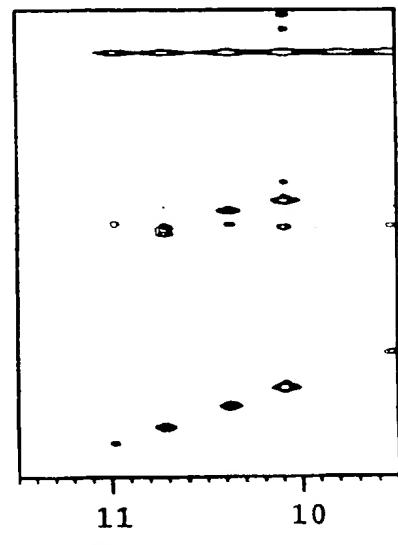


FIG. 12D



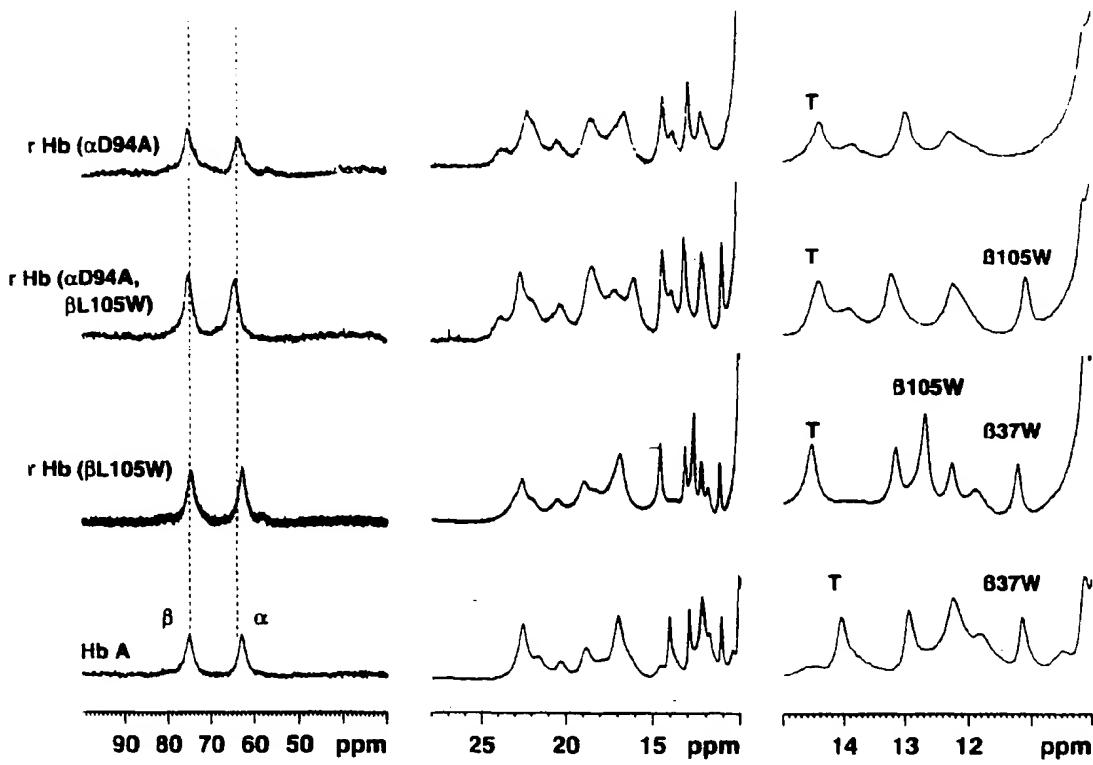


FIG. 13A

FIG. 13B

FIG. 13C

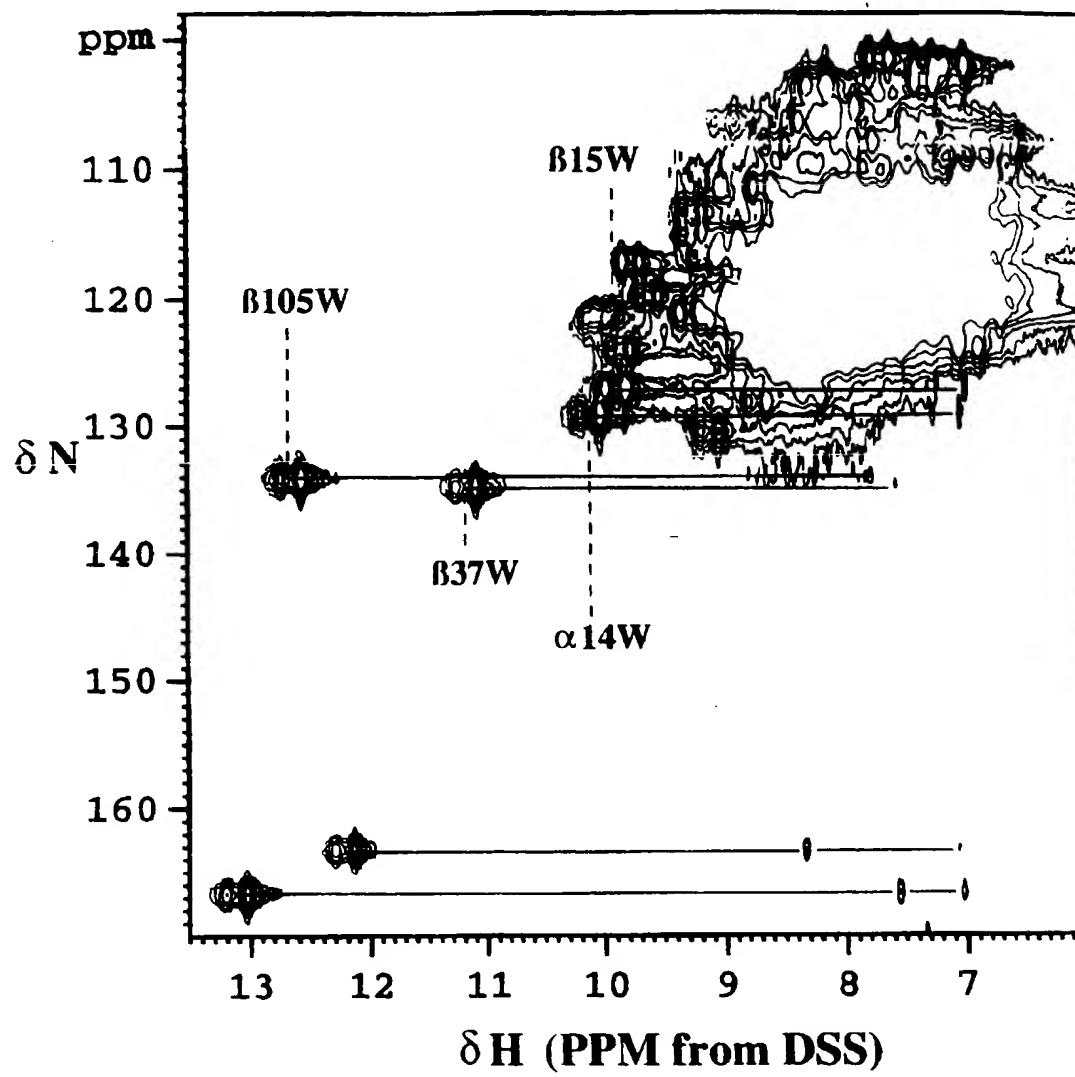


FIG. 14

FIG. 15A

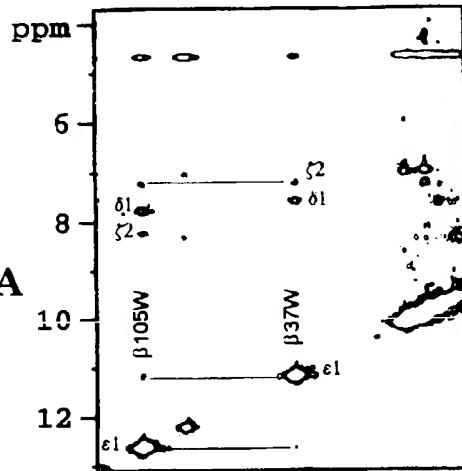


FIG. 15B

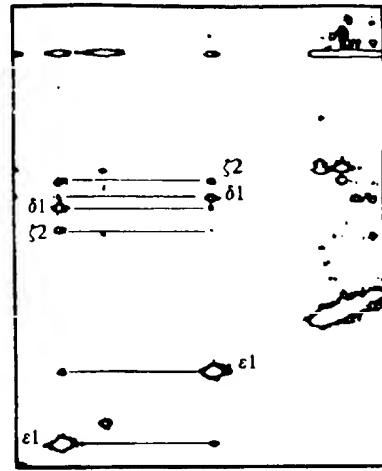


FIG. 15C

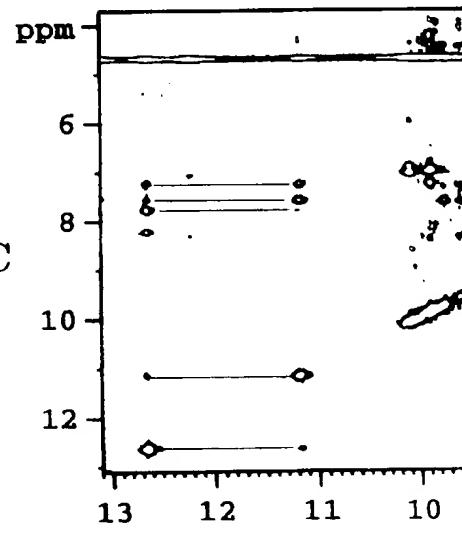
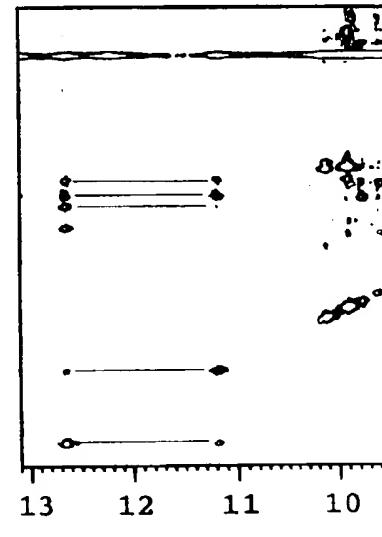


FIG. 15D



PPM from DSS

FIG. 16 A

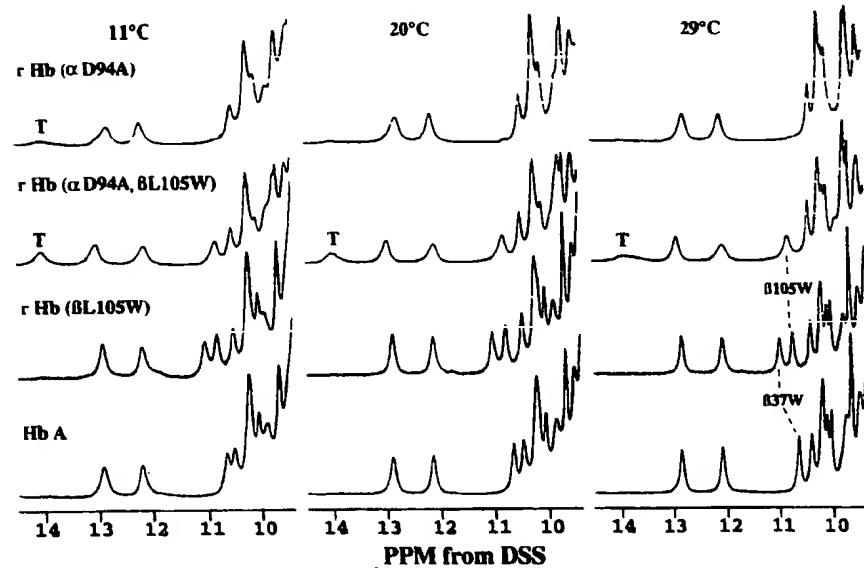


FIG. 16B

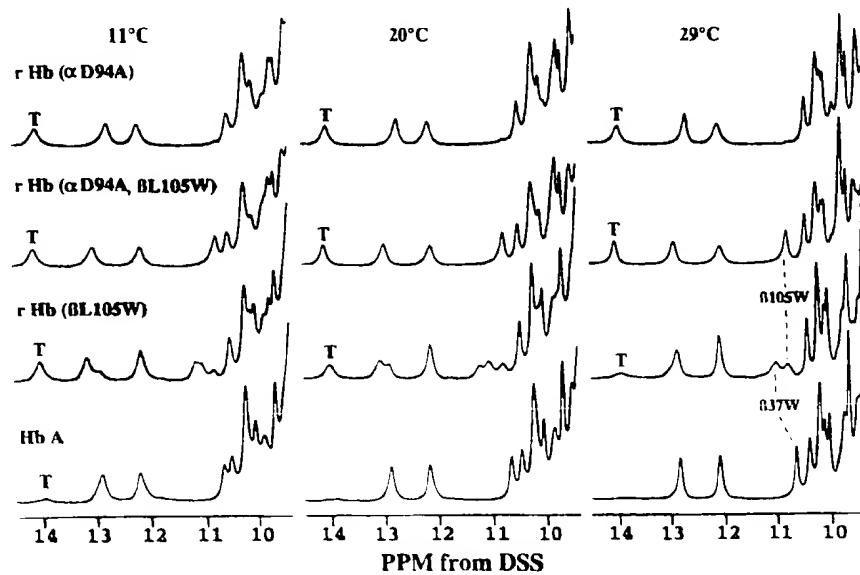


FIG. 17A

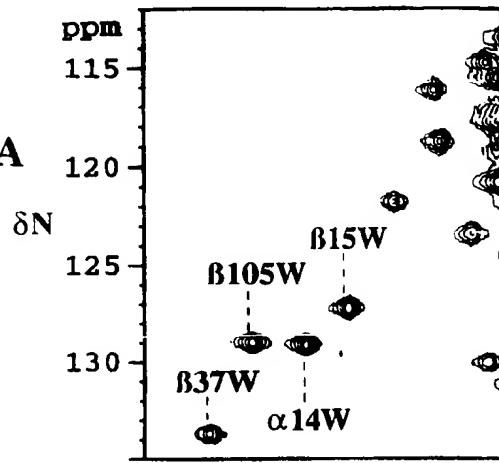


FIG. 17B

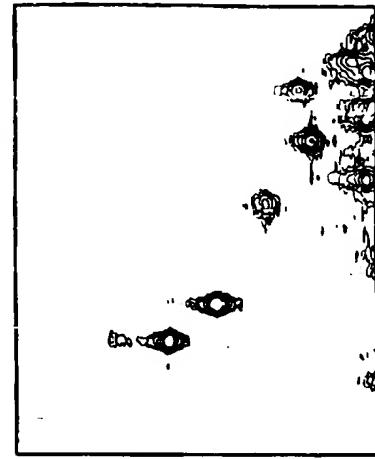


FIG. 17C

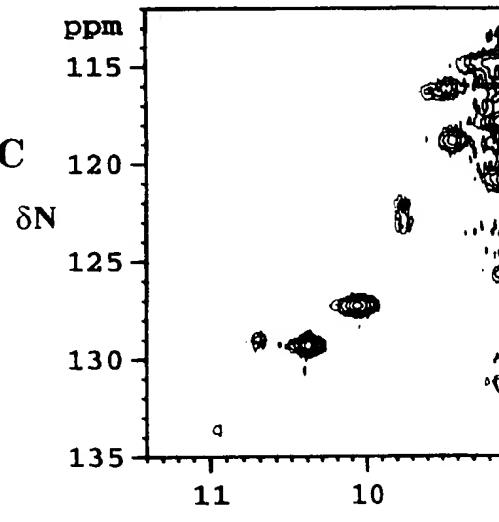


FIG 17D

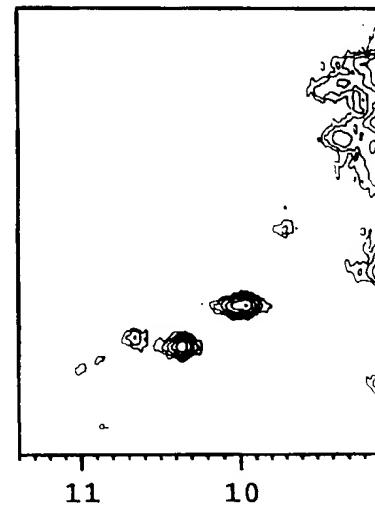


FIG. 18A

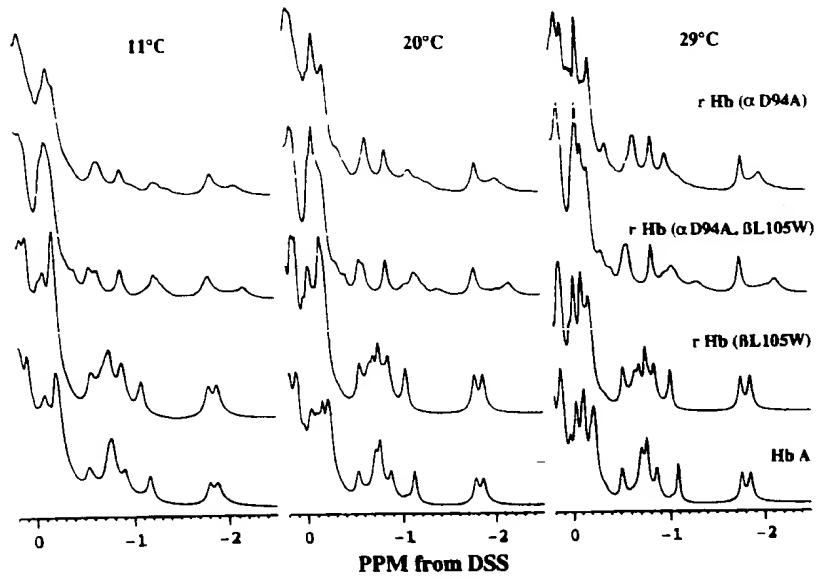


FIG. 18B

